

SUPPLEMENTARY MATERIAL

Supplementary Table 1 - Non-ataxic signs and symptoms of SCA patients and relevant medical history, according to presence of symptoms. Multiparity is defined as at least 2 vaginal deliveries. Prostate disease includes benign prostate enlargement and adenocarcinoma (1 pt). Numbers represent n (%). (total = 51 patients).

	SCA1	SCA2	SCA3	SCA6	SCA7	TOTAL
Pyramidal features						
Hyperreflexia	3 (75.0)	1 (10.0)	4 (30.8)	3 (17.6)	2 (33.3)	13 (26.0)
Babinsky sign	1 (25.0)	1 (10.0)	1 (7.7)	2 (11.8)	0	5 (10.0)
Spasticity	2 (50.0)	0	7 (53.8)	2 (11.8)	3 (50.0)	14 (28.0)
Extrapyramidal features	2 (50.0)	4 (40.0)	6 (46.2)	1 (5.9)	2 (33.3)	13 (26.0)
Peripheral nervous system involvement						
Distal hypo/arreflexia	1 (25.0)	8 (80.0)	8 (61.5)	8 (47.1)	1 (16.7)	26 (52.0)
Impaired vibration sense	3 (75.0)	7 (70.0)	11 (84.6)	10 (58.8)	1 (16.7)	32 (64.0)
Muscle atrophy	0	0	3 (23.1)	0	0	3 (6.0)
Fasciculations	0	1 (10.0)	2 (15.4)	0	0	3 (6.0)
Relevant previous medical history						
Multiparity	0	2 (18.2)	3 (23.1)	8 (47.1)	3 (50.0)	16 (31.4)
Pelvic organ prolapse	0	0	0	1 (5.9)	0	1 (2.0)
Prostate disease	1 (25.0)	1 (9.1)	0	2 (11.8)	1 (16.7)	5 (9.8)
Vascular risk factors						
Diabetes mellitus	0	1 (9.1)	0	4 (23.5)	1 (16.7)	6 (11.8)
Other risk factors (essential hypertension, dyslipidemia)	1 (25.0)	1 (9.1)	2 (15.4)	6 (35.3)	1 (16.7)	11 (21.6)

Supplementary Table 2 – Pattern of bladder symptoms in SCA patients - patients with scores ≥ 1 on the overactive bladder (OAB), lowstream (LS) and stress urinary incontinence (SUI) score of the urinary symptom profile (USP) questionnaire. Numbers represent n (%). (total = 50 patients, 1 pt with indwelling catheter).

	SCA1	SCA2	SCA3	SCA6	SCA7	TOTAL
OAB score (≥ 1 point)	4 (100)	7 (63.6)	10 (83.3)	15 (88.2)	5 (83.3)	41 (82.0)
Frequency	4 (100)	6 (54.6)	8 (66.7)	13 (76.5)	3 (50.0)	34 (68.0)
Urgency	4 (100)	6 (54.6)	9 (75.0)	10 (58.8)	5 (83.3)	34 (68.0)
Incontinence	1 (25.0)	3 (27.3)	7 (58.3)	7 (41.2)	3 (50.0)	21 (42.0)
Polyuria	2 (50.0)	2 (18.2)	5 (41.7)	5 (29.4)	0	14 (28.0)
Nocturia	2 (50.0)	1 (9.1)	4 (33.3)	6 (35.3)	2 (33.3)	15 (30.0)
Nocturnal incontinence	0 (27.3)	3 (8.3)	1 (8.3)	2 (11.8)	0	6 (12.0)
LS score (≥ 1 point)	2 (50.0)	4 (36.4)	4 (33.3)	4 (23.5)	4 (66.7)	18 (36.0)
Voiding	1 (25.0)	0 (25.0)	3 (25.0)	0 (25.0)	2 (33.3)	6 (12.2)
Urinary Flow	2 (50.0)	2 (18.2)	2 (16.7)	1 (5.9)	2 (33.3)	9 (18.4)
Stream	2 (50.0)	4 (36.4)	2 (16.7)	4 (23.5)	1 (16.7)	13 (26.5)
SUI (≥ 1 point)	1 (25.0)	1 (9.1)	6 (50.0)	5 (29.4)	3 (50.0)	16 (32.0)

Supplementary Table 3 – International Prostate Symptom Score (I-PSS) and SF-Qualiveen (SF-Q) questionnaires depiction according to SCA subtype. Severity of bladder symptoms in I-PSS score was defined in mild [1-7] and moderate [8-19]. The last lines depict Spearman correlation rank between SF-Qualiveen and other LUT symptom scores – Urinary Symptom profile (USP) questionnaire and I-PSS. (total =49 patients).

	SCA1	SCA2	SCA3	SCA6	SCA7	TOTAL
I-PSS	8.5	4.91	6.8	4.94	6.20	5.8
mean (SD)	(3.79)	(6.20)	(4.02)	(3.13)	(5.17)	(4.41)
Mild	2	6	6	11	2	27
[n(%)]	(50.0)	(54.5)	(50.0)	(64.7)	(33.3)	(55.1)
Moderate	2	2	5	5	2	16
[n(%)]	(50.0)	(18.2)	(41.7)	(29.4)	(33.3)	(32.7)
SF-Q	1.44	0.59	1.43	0.70	1.10	0.96
overall	(0.55)	(0.95)	(1.2)	(0.80)	(1.29)	(1.02)
mean (SD)						
Bothers	0.75	0.5	1.25	0.38	0.92	0.70
	(0.29)	(0.95)	(1.27)	(0.67)	(1.07)	(0.97)
Fears	2.0	0.727	1.7	0.72	1.25	1.10
	(0.70)	(1.08)	(1.60)	(0.91)	(1.25)	(1.23)
Feelings	1.13	0.545	1.58	0.47	1.08	0.87
	(0.63)	(0.907)	(1.43)	(0.81)	(1.20)	(1.10)
Frequency	1.89	0.591	1.13	1.25	1.17	1.09
	(1.25)	(1.02)	(0.98)	(1.28)	(1.83)	(1.20)
SF-Qualiveen	4	5	1	14	4	38
(≥ 1 point)	(100)	(45.5)	(91.7)	(87.5)	(66.7)	(77.6)
n (%)						
Spearman rank order correlation						
		I-PSS	USP score			
SF-Qualiveen		Positive correlation	Positive correlation			
		$r=0.583$; $p<0.001$	$r=0.806$; $p<0.001$			

SD: standard deviation.

Supplementary table 4 – Description of self reported bowel complaints, and mean Neurogenic Bowel Dysfunction (NBD) score, classified as very minor – scores from 1 to 6. (total = 49 patients).

	SCA1	SCA2	SCA3	SCA6	SCA7	TOTAL
Self-reported bowel complaints n (%)	1 (25.0)	1 (10.0)	2 (15.4)	1 (5.9)	1 (16.7)	6 (12.0)
NBD Mean (SD)	0.75 (1.5)	0.60 (1.27)	1.17 (2.21)	0.65 (1.46)	1.0 (1.55)	0.82 (1.6)
Very minor [n(%)]	4 (100)	10 (100)	12 (100)	17 (100)	6 (100)	49 (100)
Pt scoring more than 1 point in NBD	1 (25.0)	3 (30.0)	3 (25.0)	6 (35.3)	3 (50.0)	16 (32.7)
QoL related to bowel symptoms – NBD score. Mean (SD)	7.7 (1.5)	9.9 (0.35)	9.0 (1.67)	8.7 (1.6)	9.4 (0.89)	9.03 (1.42)

SD: standard deviation; Pt: patients; QoL: quality of life.

Supplementary table 5 – Summary of most representative studies evaluating LUT symptoms in SCA patients.

Study	Type of SCA					Comments
	SCA1	SCA2	SCA3	SCA6	SCA7	
Schmitz-Hubsch T, et al.⁷	35%	40.4%	45.6%	31.1%		Binary question INAS
Lee WY, et al.⁸	17%	12%	13%	20%	0%	% of urinary incontinence by clinical assessment
Jang M, et al.⁹	9.0%	7.8%	7.7%	15.0%	50.0%	ICS questionnaires.
Schols L, et al.¹⁰			Urge incontinence 19%			Clinical assessment
França Jr MC, et al.¹¹			Nocturia (64%) Urine retention (54%).			Comprehensive questionnaire
Yeh TH, et al.¹²			Nocturia (53.3%); urine incontinence (13.3%)			Comprehensive questionnaire
Musegante AF, et al.¹³			17 (13.9%) - urgency (12.3%), incontinence (7.3%)			Comprehensive questionnaire
Tateno F, et al.¹⁴				56% Urinary frequency and incontinence (33%); Urinary urgency (22%)		Comprehensive questionnaire
Pedroso J.L., et al.¹⁵		27.27%				Binary question INAS